

Domestic Water Heater Replacement NW Regional Youth Center (Kansas City, Missouri)



OWNER: STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

DEPARTMENT OF
SOCIAL SERVICES
DIVISION OF YOUTH SERVICES

PROJECT
MANAGEMENT: OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

DESIGNER: Lankford Fendler + associates

PROJECT NUMBER: H1905-01

SITE NUMBER: 7703
ASSET NUMBER: 8877703004

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR



OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DOMESTIC WATER HEATER
REPLACEMENT

NW MISSOURI REGIONAL
YOUTH CENTER

4901 NE BARRY RD.
KANSAS CITY, MO 64156

PROJECT # H1905-01
SITE # 7703
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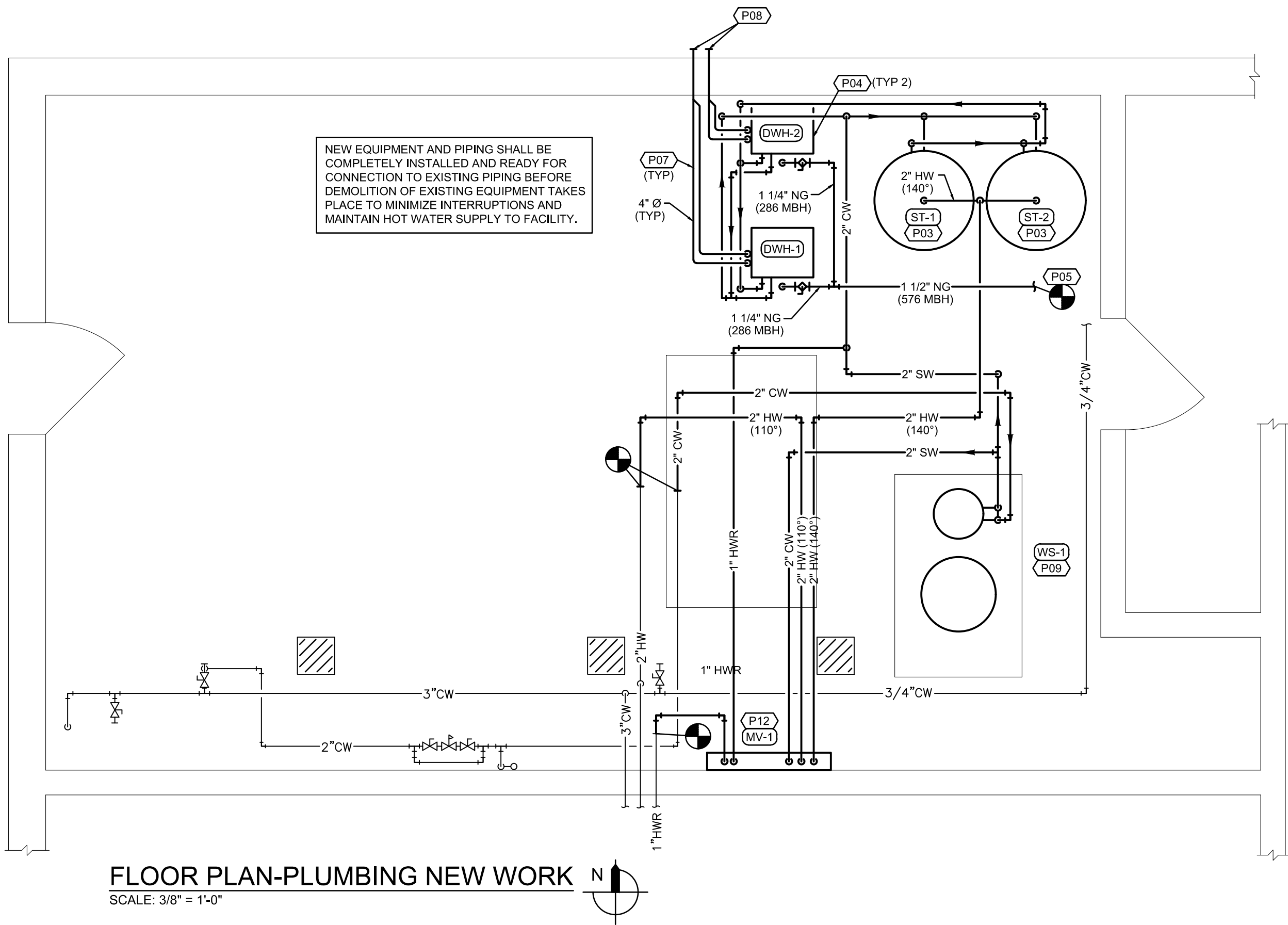
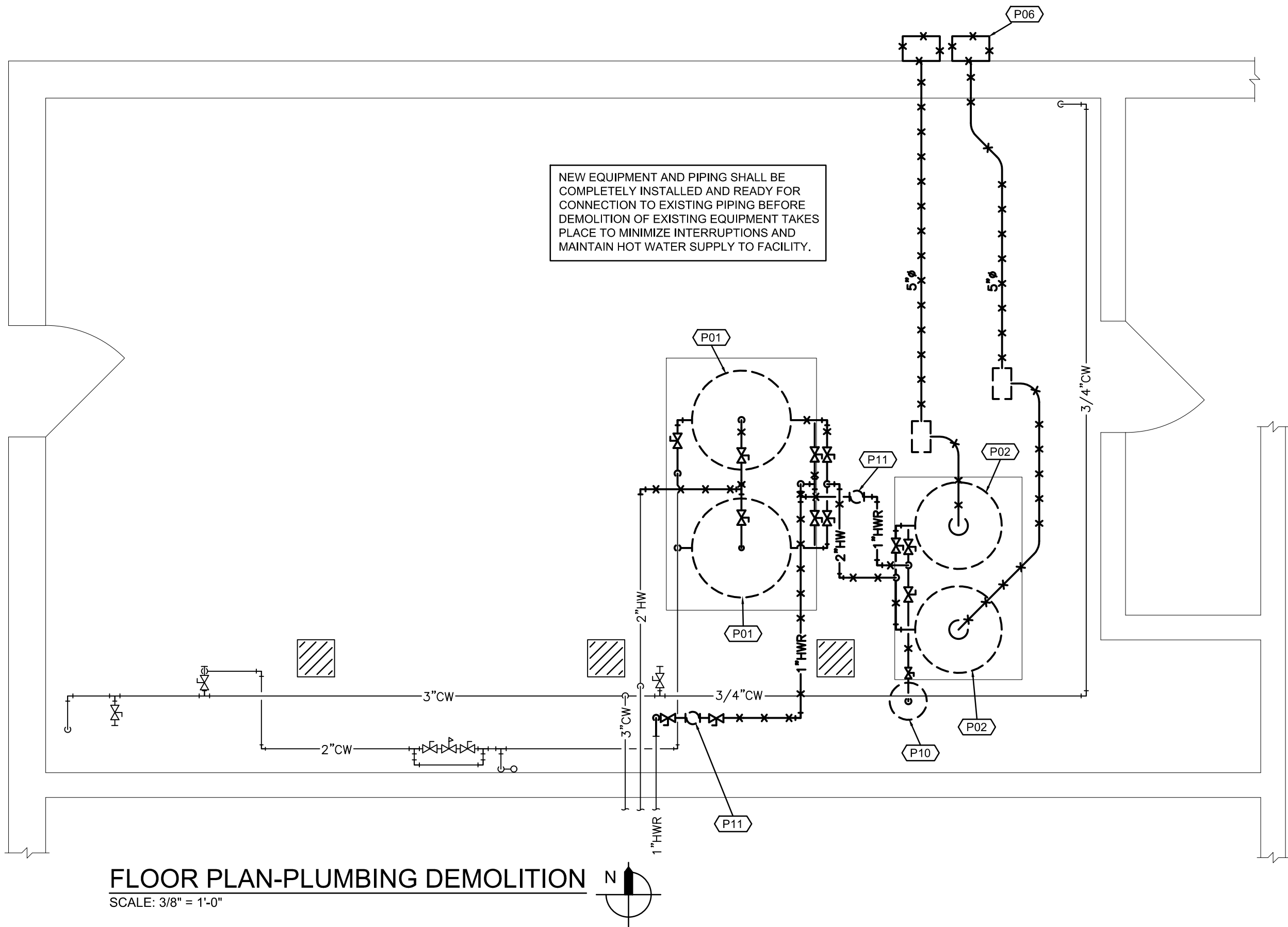
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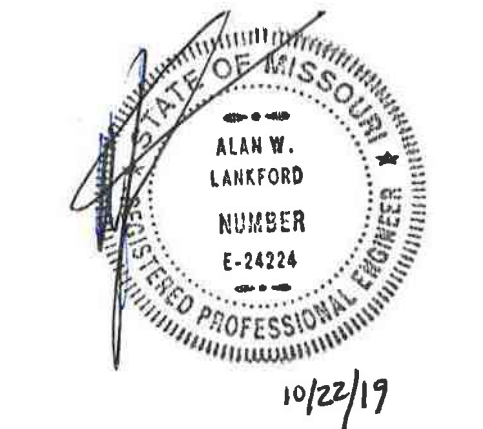
SHEET 1 OF 4
10.22.2019



FLOOR PLAN NOTES

1. REMOVE EXISTING STORAGE TANKS, ACCESSORIES, AND PIPING.
2. REMOVE EXISTING WATER HEATERS, ACCESSORIES, AND PIPING. CAP REMAINING PIPING AND PREPARE FOR RECONNECTION, RE: NEW WORK.
3. NEW ASME STORAGE TANKS, LOCHINVAR RGA0257. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
4. NEW GAS FIRED WATER HEATERS, RE: DETAIL. INSTALL HEATERS AND ALL REQUIRED FITTINGS AND ACCESSORIES PER MANUFACTURER'S RECOMMENDATIONS. CONNECT NATURAL GAS PIPING WITH GAS COCK, DIRT LEG, AND UNION. ROUTE DRAIN LINE TO NEAREST EXISTING FLOOR DRAIN AND INDIRECT WASTE.
5. CONNECT TO EXISTING NATURAL GAS PIPING OF EQUAL OR GREATER SIZE.
6. REMOVE EXISTING VENTS THRU WALL. PATCH PENETRATIONS TO MATCH EXISTING.
7. ROUTE PVC INTAKE/VENT PIPING TO CONCENTRIC WALL VENT. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
8. INSTALL CONCENTRIC VENT IN EXTERIOR WALL.
9. NEW WATER SOFTENER. INSTALLED ON EXISTING HOUSEKEEPING PAD AFTER DEMOLITION OF EXISTING EQUIPMENT. PROVIDE WITH BYPASS PER MANUFACTURER'S RECOMMENDATIONS. ROUTE DRAIN LINE TO NEAREST EXISTING FLOOR DRAIN AND INDIRECT WASTE.
10. REMOVE EXISTING EXPANSION TANK AND ALL ACCESSORIES.
11. REMOVE EXISTING CIRCULATION PUMP AND ALL ACCESSORIES.
12. COORDINATE LOCATION OF MIXING VALVE WITH EXISTING ROOF ACCESS LADDER.

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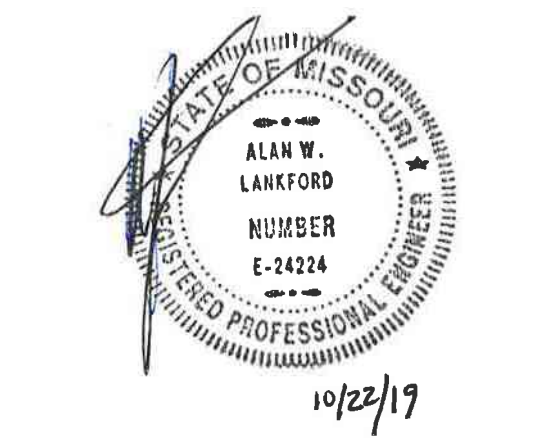
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FLOOR PLANS -
PLUMBING

SHEET NUMBER:

P-101

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GENERAL NOTES (TYPICAL ALL SHEETS)

- A. PLUMBING CONTRACTOR IS RESPONSIBLE TO SEE THAT WORK MEETS AND IS IN ACCORDANCE WITH ALL REQUIREMENTS OF FEDERAL, STATE, AND LOCAL LAWS AND CODES AND/OR REQUIREMENTS, INCLUDING HEALTH CODES AND BUILDING OWNER.
- B. ALL EXISTING PIPING SHOWN ON DRAWINGS IS SCHEMATIC AND IS BASED ON EXISTING RECORD DRAWINGS PROVIDED BY THE OWNER AND DO NOT REFLECT EXACT EXISTING CONDITIONS. CONTRACTOR TO FIELD VERIFY EXACT DEPTH AND/OR LOCATIONS ON JOB SITE. CONTRACTOR SHALL REROUTE NEW WORK TO ACCOMMODATE EXACT LOCATIONS OF EXISTING UTILITIES, STUBOUTS AND/OR CONNECTIONS.
- C. CUTTING AND PATCHING OF FLOORS, WALLS, CEILING, ETC., REQUIRED IN STRICT ACCORDANCE WITH THE RULES AND REGULATIONS OF THE ARCHITECT'S AND/OR BUILDING OWNER REQUIREMENTS.
- D. COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO INSTALLATION TO AVOID ROUTING CONFLICTS.
- E. ANY MATERIAL REMOVED THAT OWNER DOES NOT WISH TO RETAIN SHALL BE REMOVED FROM PROJECT SITE AND DISPOSED OF BY CONTRACTOR.
- F. INSTALL ELASTOMERIC JOINT SEALER AROUND ALL PIPES PASSING THRU INTERIOR NON-RATED CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, AND CONCRETE FLOOR/ROOF SLABS. FOR FIRE RATED INTERIOR CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, AND CONCRETE FLOOR/ROOF SLABS SEAL ALL PIPES. INSTALL FIRESTOP MATERIALS IN ALL GAPS PRIOR TO SEALANT APPLICATION. INSTALL SEALER ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

PLUMBING SYMBOLS

- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- NEW PIPING
- FLOW ARROW
- CW COLD WATER
- HW HOT WATER
- HWR HOT WATER RETURN
- SW SOFTENED WATER
- NG NATURAL GAS
- V SANITARY VENT ABOVE GROUND/FLOOR
- W SANITARY WASTE BELOW GROUND/FLOOR
- BALANCE VALVE
- GAS SHUT-OFF COCK
- CHECK VALVE
- PRESSURE & TEMPERATURE RELIEF VALVE
- STRAINER WITH BLOW DOWN VALVE
- SHUT OFF VALVE
- IN-LINE PUMP
- UNION
- FLOOR DRAIN OR EQMT FLOOR DRAIN
- PIPE DROP/PIPE RISE
- BOTTOM OUTLET TEE
- TOP OUTLET TEE
- EQUIPMENT TYPE AND DESIGNATION
- CONNECT TO EXISTING

WATER SOFTENER SCHEDULE

MARK NO.	MANUFACTURER	SERIES	MODEL	INLET WATER GRAINS	DISCHARGE WATER GRAINS	OPERATING PRESSURE PSIG	DESIGN (EACH UNIT)										ELECTRICAL				NOTES		
							DESIGN FLOW GPM	DELTA P PSIG	CONTINUOUS FLOW GPM	DELTA P PSIG	PEAK FLOW GPM	DELTA P PSIG	MIN FLOW GPM	BACKWASH FLOW GPM	RECOND WATER GALLONS	REGEN GAL	SOFTENING RATE GPM/SF	RESIN QTY CU FT	UNIT CAPACITY kgr @105 # SALT	VOLT		ø	HZ
WS-1	CULLIGAN	HI-FLOW	HE 1.5 120-DF	12	0	30-120	28	22	23.3	15	31.8	25	3	5.5	165	11860	20	4	119	120	1	60	1 THRU 4
NOTES:																							
1. AUTOMATIC SIMPLEX PROGRESSIVE WATER METER DEMAND SYSTEM WITH (1) 16"x65" POLYESTER RESIN TANK AND (1) 24"DIA x 40" PLASTIC BRINE TANK.																							
2. SYSTEM TO BE COMPLETE WITH PRESSURE VESSELS, SOFTENING RESIN, CONTROL VALVES, BRINE MAKER AND ELECTRONIC CONTROLLER. SYSTEM SHALL INCLUDE A TOP MOUNTED CONTROL VALVE WITH AN UPPER DISTRIBUTION SINGLE POINT DISTRIBUTOR SYSTEM. CONTROLS SHALL BE FULLY AUTOMATIC MICROPROCESSOR BASED WITH A CONTROLLER THAT SEQUENCES ALL STEPS OF AUTOMATIC REGENERATION.																							
3. TOTAL SYSTEM CAPACITY OF 28 GPM AT 22 PSIG WITH GRAIN REDUCTION TO 0 WITH DAILY USAGE ESTIMATED AT 3000 GALLONS.																							
4. PIPE WITH BYPASS PER MANUFACTURER REQUIREMENTS, RE. DETAIL.																							

WATER HEATER SCHEDULE (GAS WITH SEPARATED STORAGE)

MARK NO.	MANUFACTURER	MODEL NO.	RECOVERY (GPH @ 100 F)	TEMP. DIFFERENCE DEG F	INPUT (MBH)	MIN. THERMAL EFF. %	WATER VOLUME GAL	MAXIMUM FLOW GPM	WATER DELTA PSIG AT DESIGN GPM	VENT SIZE (IN.)	ELECTRICAL			NOTES
											VOLT	ø	HZ	
DWH-1.2	LOCHINVAR	AWN286PM	332	100	285	96	2.5	30	17.1	4	120	1	60	1 THRU 5
NOTES: 1. HIGH EFFICIENCY SEALED COMBUSTION CONDENSING WATER HEATER WITH STAINLESS STEEL HEAT EXCHANGER, 150 PSIG WORKING PRESSURE, ASME PRESSURE VESSEL, FULLY MODULATING GAS TRAIN WITH REGULATOR, 5:1 TURNDOWN, 1/4" WG MAXIMUM AND 4" WG MINIMUM GAS PRESSURE. PROVIDE FM GAS TRAIN WHERE REQUIRED. 2. CONTROL PANEL WITH SEQUENCER FOR MULTIPLE UNIT CONFIGURATION, BACNET COMPATIBLE COMMUNICATION GATEWAY, REMOTE ALARM CONTACTS. 3. PROVIDE WITH INTEGRAL RECIRCULATION PUMP, TEMPERATURE AND/OR PRESSURE RELIEF VALVE AND DRAINS, CONDENSATE NEUTRALIZATION KIT, MANUFACTURER'S STANDARD STAINLESS STEEL WALL OR ROOF CAP AND FLASHING. 4. MOUNT WATER HEATERS ON 0.18" DEFLECTION NEOPRENE PADS ON 6" CONCRETE HOUSEKEEPING PAD. 5. PIPE CIRCULATING LOOP WITH REVERSE RETURN PER MANUFACTURER RECOMMENDATIONS, RE. PIPING DIAGRAM.														

MIXING VALVE SCHEDULE

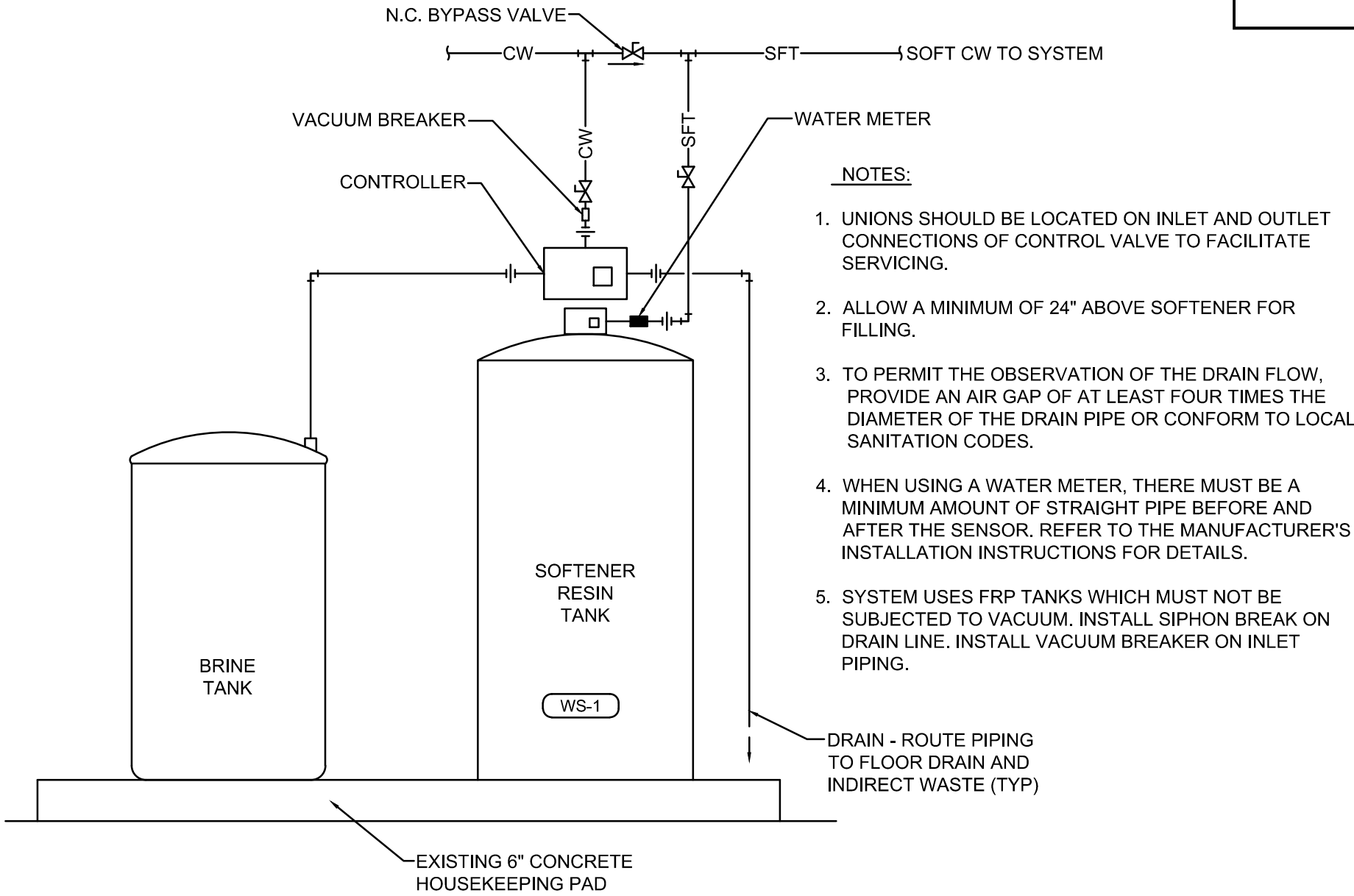
MARK NO.	MANUFACTURER	MODEL	FLUID	CW TEMP. (°F)	HW TEMP. (°F)	MIXED TEMP. (°F)	MAX FLOW RATE (GPM)	MIN FLOW RATE (GPM)	MAX HEAD (PSIG) @ MAX FLOW	ELECTRICAL			NOTES
										VOLT	ø	HZ	
MV-1	LEONARD	3NB-LF	CW	40	140	120	40	1	10.0	120	1	60	1, 2
NOTES: 1. PACKAGED UNISTRUT MOUNTED HI-LOW HIGH CAPACITY WATER TEMPERATURE CONTROL STATION INCLUDING LOW AND HIGH FLOW THERMOSTATIC MIXING VALVES, COMPLETE WITH ALL WIRING, CONTROLS WITH GROUND FAULT PROTECTION, INDICATOR LIGHTS, PIPING AND VALVES, AQUASTAT, DRAINS AND TEST CONNECTION. PACKAGE INCLUDES HOT AND COLD PIPING MANIFOLDS, BYPASS PIPING, FULL PORT BALL SERVICE, CHECK AND BALANCING VALVES, PRESSURE GAGES AND INLET & OUTLET THERMOMETERS, RETURN PIPING, CHECK AND BALANCE VALVE. 2. PROVIDE WITH LEONARD PIPING METHOD #5.													

DOMESTIC WATER STORAGE TANK SCHEDULE

MARK NO.	MANUFACTURER	MODEL	CAPACITY GAL	DIMENSIONS DIA x H	TANK ORIENTATION	LINING	NOTES
ST-1.2	LOCHINVAR	RGA0257	257	34 x 91	VERTICAL	GLASS	1,2
NOTES: 1. CARBON STEEL TANK WITH MAN-HOLE, PIPE LEG, STAND, 2" INSULATION AND ENAMELED METAL JACKET. PROVIDE WITH TAPINGS FOR INLET, OUTLET, DRAIN, VACUUM BREAKER, THERMOMETER, RELIEF AND AQUASTAT AND ACCESSORIES AS REQUIRED BY WATER HEATER MANUFACTURER. 5 YEAR WARRANTY. 2. PROVIDE ASME CODE HWL STAMPED VESSEL. 3. MOUNT ON 6" CONCRETE PAD.							

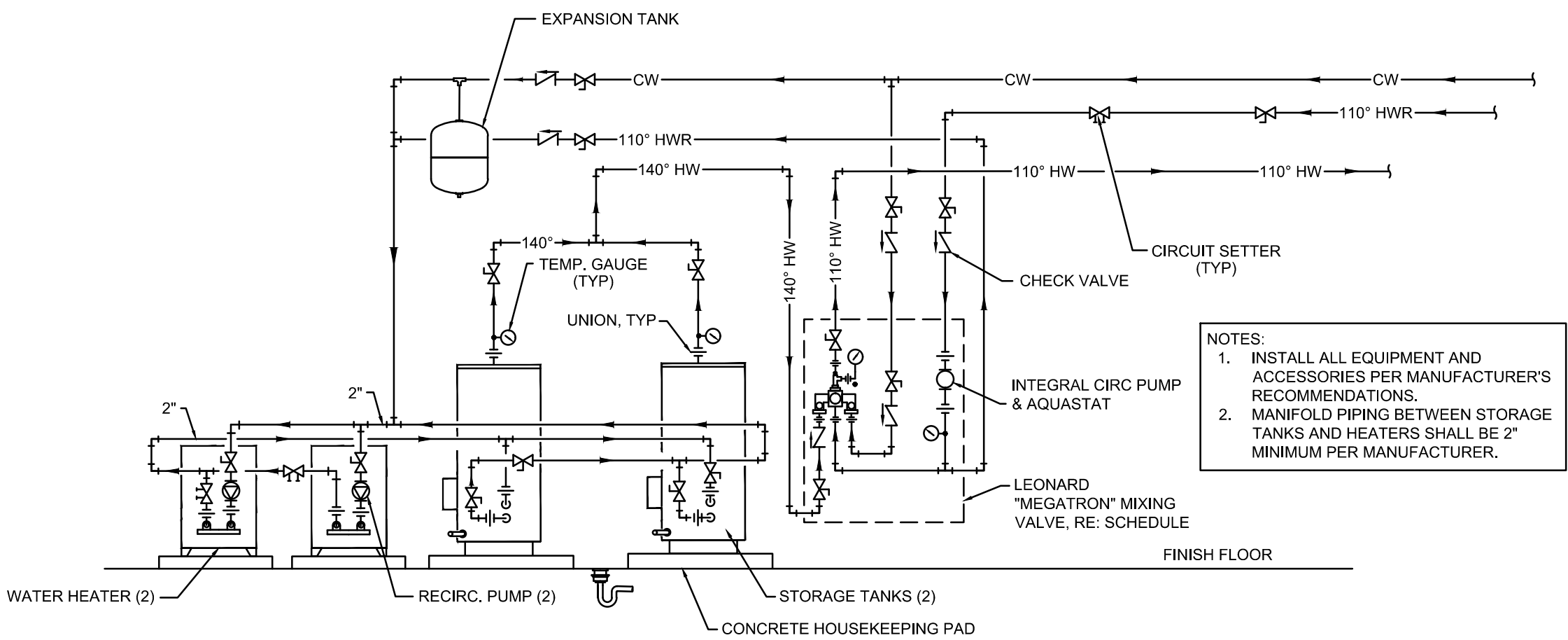
EXPANSION TANK SCHEDULE

MARK NO.	MANUFACTURER	MODEL	FLUID SERVED	TANK STYLE	ACCEPTANCE VOLUME (GAL.)	VOLUME (GAL.)	NOTES
ET-1	ELBI	DTS-80	DOM HW	BLADDER	18.9	21	1,2,3
NOTES: 1. CARBON STEEL PRESSURE VESSEL WITH FDA APPROVED BUTYL BLADDER. STAINLESS STEEL CONNECTIONS, CHARGING VALVE. 2. PRECHARGED TO 40 PSIG OR AS OTHERWISE INDICATED. 3. ASME STAMPED 150 PSIG PRESSURE VESSEL.							



WATER SOFTENER DETAIL

NO SCALE



WATER HEATER PIPING DIAGRAM

NO SCALE

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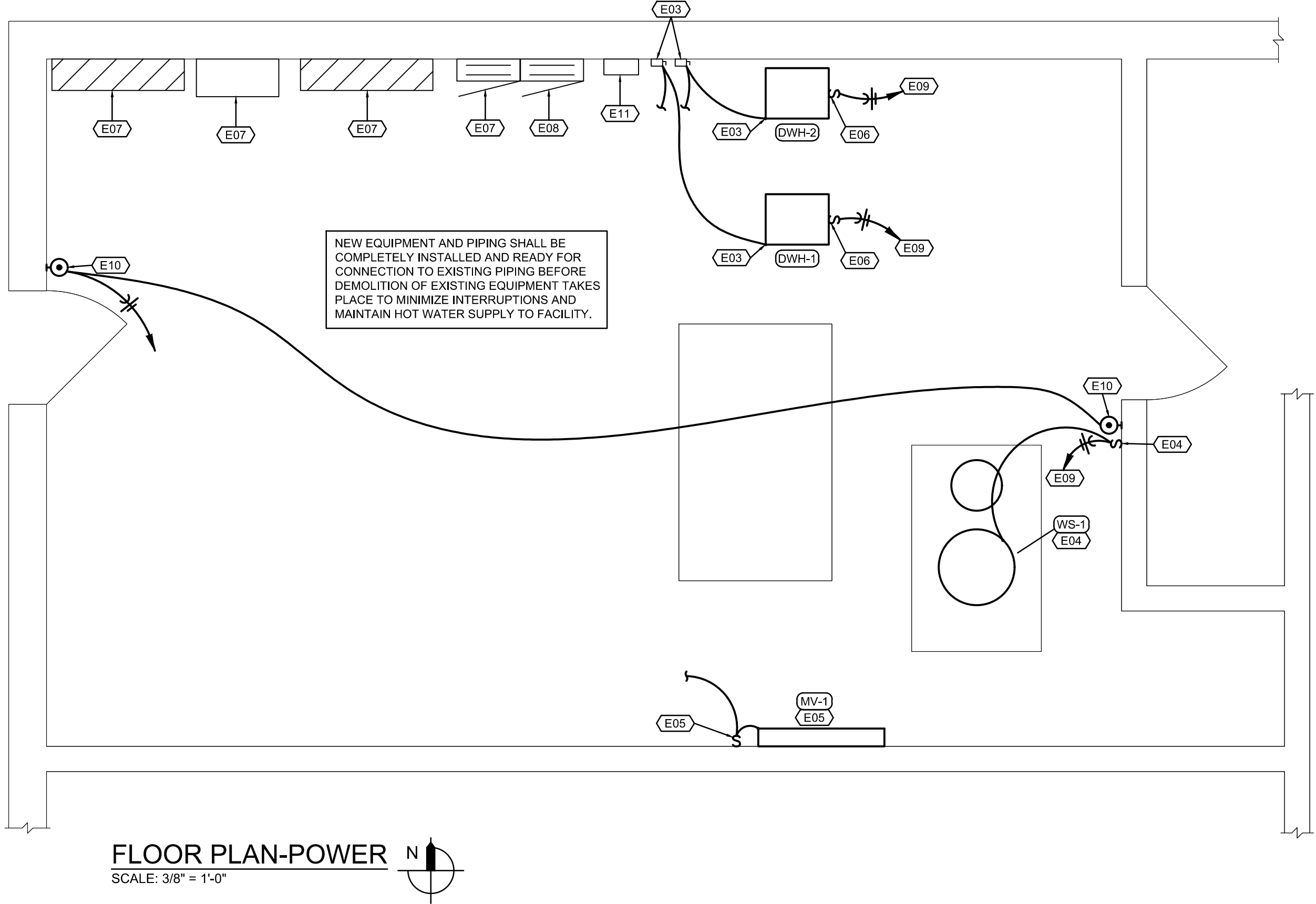
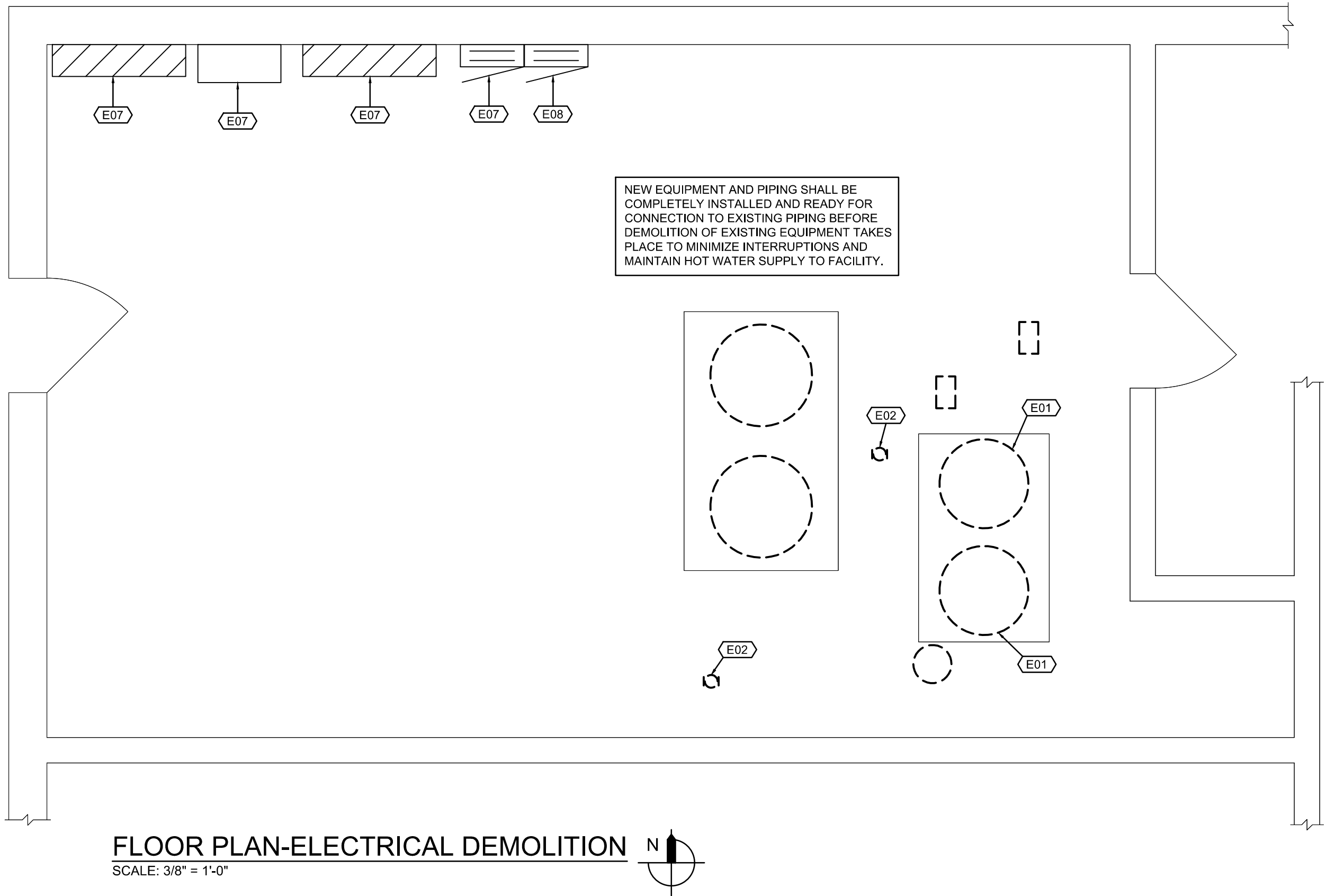
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PLBG GEN. NOTES,
SYMBOLS, DETAILS,
& SCHEDULES

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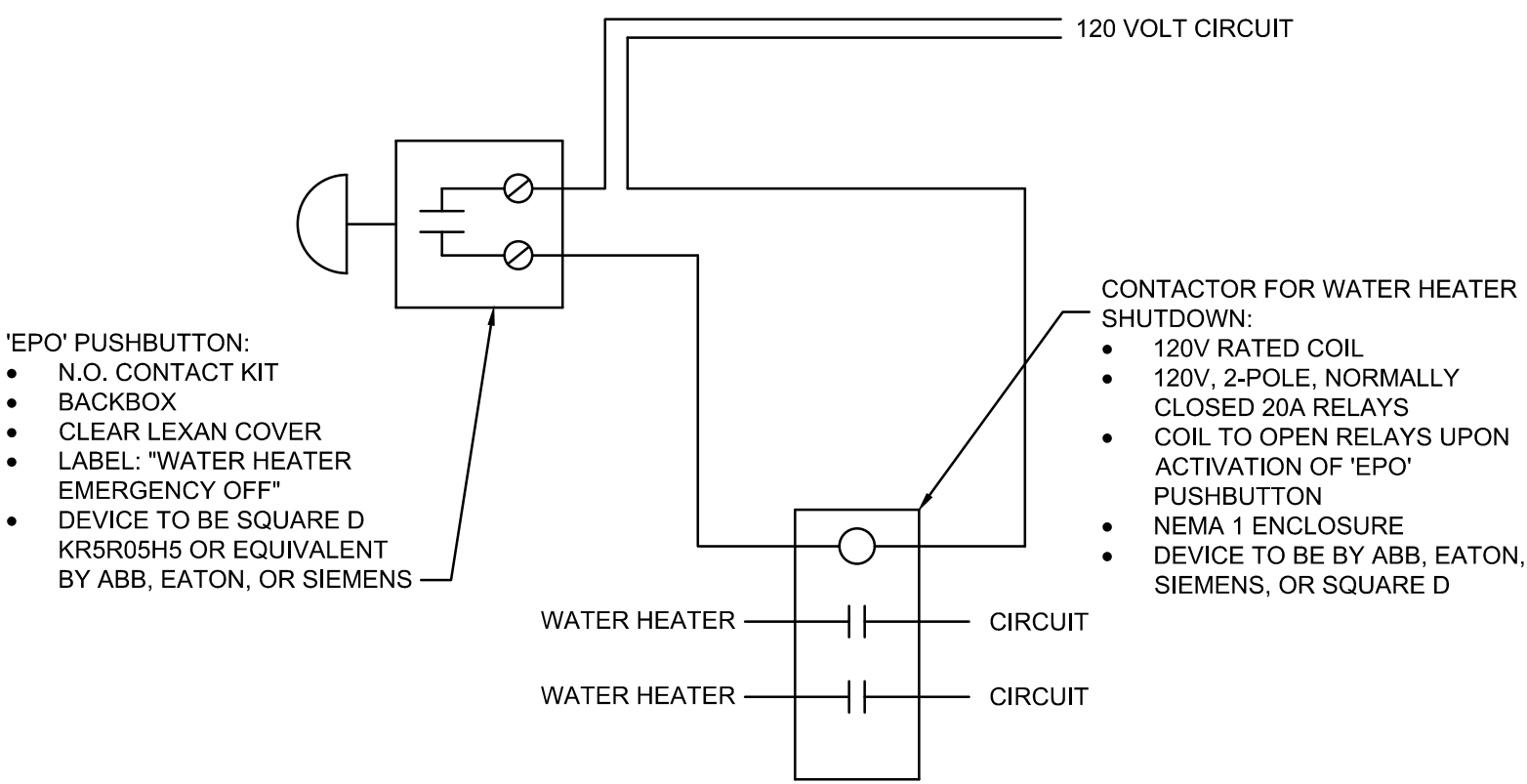
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SHEET 3 OF 4
10.22.2019



BRANCH CIRCUIT COPPER CONDUCTOR AND CONDUIT SIZING CHART*						
OVERCURRENT PROTECTION DEVICE RATING (AMPS)	REQUIRED CONDUCTOR SIZE	EQUIPMENT GROUNDING CONDUCTOR SIZE	SINGLE PHASE 2 WIRE + GND. CONDUIT SIZE	SINGLE PHASE 3 WIRE + GND. CONDUIT SIZE	THREE PHASE 3 WIRE + GND. CONDUIT SIZE	THREE PHASE 4 WIRE + GND. CONDUIT SIZE
15	12 AWG	12 AWG	3/4"	3/4"	3/4"	3/4"
20	12 AWG	12 AWG	3/4"	3/4"	3/4"	3/4"
25	10 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
30	10 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
35	8 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
40	8 AWG	10 AWG	3/4"	3/4"	3/4"	3/4"
45	6 AWG	10 AWG	3/4"	3/4"	3/4"	1"
50	6 AWG	10 AWG	3/4"	3/4"	3/4"	1"
60	4 AWG	10 AWG	1"	1"	1"	1-1/4"
70	4 AWG	8 AWG	1"	1"	1"	1-1/4"
80	3 AWG	8 AWG	1"	1-1/4"	1-1/4"	1-1/4"
90	2 AWG	8 AWG	1"	1-1/4"	1-1/4"	1-1/4"
100	1 AWG	8 AWG	1-1/4"	1-1/2"	1-1/2"	1-1/2"

- * = UNLESS OTHERWISE NOTED ON THE DRAWINGS.
* = UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL BRANCH CIRCUITS AND FEEDERS TO BE PROVIDED WITH A NEUTRAL WIRE.
* = ALL CONDUCTORS SIZED ON THE POWER RISER DIAGRAM OR IN BRANCH CIRCUIT CONDUCTOR TABLE ARE BASED ON 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY OR CABLE. CONDUCTORS SHALL BE DERATED IN ACCORDANCE WITH THE NEC IF 4 OR MORE CONDUCTORS ARE PLACED IN A RACEWAY OR CABLE.



EPO SWITCH SCHEMATIC
NO SCALE

GENERAL NOTES (TYPICAL ALL SHEETS)

- ANY MATERIAL REMOVED THAT OWNER DOES NOT WISH TO RETAIN SHALL BE REMOVED FROM PROJECT SITE AND DISPOSED OF BY THE CONTRACTOR.
- NEW CIRCUITRY SHOWN FOR NEWEXISTING POWER AND LIGHTING IS DIAGRAMMATIC AND IS INTENDED TO SHOW WHICH DEVICES ARE TO BE GROUPED ON INDIVIDUAL CIRCUITS. EXISTING WIRING THAT CONFORMS TO THE INTENT OF THE DRAWINGS MAY BE USED.
- PROVIDE UPDATED, TYPEWRITTEN PANELBOARD DIRECTORY FOR EACH PANELBOARD WHICH CIRCUITS HAVE BEEN ADDED TO OR MODIFIED.
- CONTRACTOR TO REFERENCE BRANCH CIRCUIT COPPER CONDUCTOR AND CONDUIT SIZING CHART FOR SIZING OF BRANCH CIRCUITS AND OR FEEDERS AT OR BELOW 100AMPS.
- CONDUIT SHALL BE USED FOR CONDUCTORS WHERE REQUIRED BY N.E.C.
- CONTRACTOR SHALL CALCULATE VOLTAGE DROP AND SIZE WIRE ACCORDINGLY, PER N.E.C.
- PROVIDE 3'-0" CLEARANCE IN FRONT OF DISCONNECTS.
- UPON REQUEST FOR ELECTRONIC FILES, CONTRACTOR SHALL FILL OUT, SIGN AND RETURN ELECTRONIC MEDIA RELEASE FORM FROM ENGINEER AND PROVIDE PAYMENT FOR FEES STIPULATED ON ELECTRONIC MEDIA RELEASE FORM. UPON RECEIPT OF COMPLETED RELEASE FORM AND PAYMENT, ELECTRONIC FILES WILL BE RELEASED.
- CONTRACTOR SHALL PROVIDE HIS/HER OWN SUPPORTING OF CABLING FROM STRUCTURE ABOVE, I.E. TEMPERATURE CONTROL WIRING, SECURITY CONTROL WIRING, FIRE ALARM CONTROL WIRING, OR ANY OTHER WIRING CONTAINING VOLTAGE. CONTRACTOR SHALL NOT RUN PARALLEL WITH OR BE SUPPORTED BY ANY UTP, COAX OR VIDEO CABLING (CABLES INDICATED ON TECHNOLOGY DRAWINGS), IF CABLES ARE FOUND TO BE SUPPORTED WITH THESE CABLES, CONTRACTOR SHALL REMOVE CABLES, REROUTE AND RE-SUPPORT AT THEIR OWN EXPENSE. IF UTP CABLES ARE DAMAGED WHILE EITHER INSTALLING OR REMOVING SUCH CABLES, THE CONTRACTOR(S) THAT DID SUCH DAMAGE SHALL COVER COST TO REPLACE CABLES AT THEIR OWN EXPENSE.

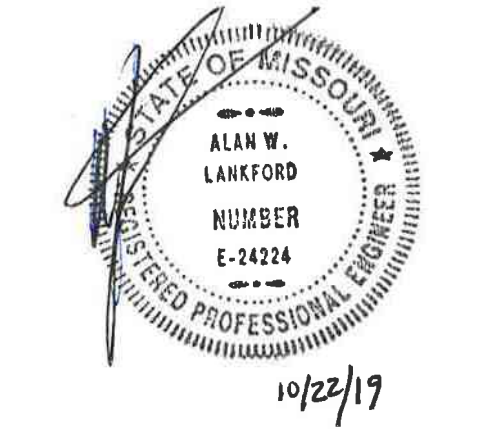
ELECTRICAL SYMBOLS

- BRANCH CIRCUIT CONCEALED IN CEILING OR WALL. ARROWS INDICATE HOMERUNS TO PANEL. ALL CONDUCTORS ARE MINIMUM NO.12 UNLESS NOTED OTHERWISE.
- PHASE CONDUCTORS
- NEUTRAL CONDUCTOR
- SWITCH-LEG AND OR TRAVELER
- GROUND CONDUCTOR
- LP1-10 PANEL - BREAKER NUMBER (IDENTIFICATION)
- CONDUIT CONCEALED IN CEILING OR WALL WITH THREE CONDUCTORS: 1-PHASE, 1-NEUTRAL, 1-GROUND WIRE. MINIMUM NO.12 WIRE UNLESS OTHERWISE SPECIFIED ON DRAWINGS.
- 208Y/120V OR 120/240V PANELBOARD (SURFACE) TOP MOUNTED 6'-0" AFF
- DISTRIBUTION PANEL (SURFACE OR FLOOR MOUNTED).
- SURFACE MOUNTED EQUIPMENT, TYPE AS INDICATED ON DRAWINGS
- POWER CONNECTION POINT
- DISCONNECT SWITCH, SIZE AND TYPE AS NOTED TOP MOUNTED 5'-0" AFF
- S SINGLE POLE SWITCH, TOP OF DEVICE BOX AT +4'-0" AFF
- PUSH BUTTON +4'-0" AFF.
- MECHANICAL EQUIPMENT CALL OUT BUBBLE
- ELECTRICAL EQUIPMENT PROVIDED BY AND INSTALLED BY E.C.
- +4'-0" HEIGHT TO CENTERLINE OF OUTLET BOX ABOVE FINISHED FLOOR
- AFF ABOVE FINISH FLOOR
- ETR EXISTING TO REMAIN

FLOOR PLAN NOTES

- DISCONNECT POWER TO EXISTING WATER HEATER AND REMOVE DISCONNECT SWITCH. EXTEND CIRCUIT TO NEW WATER HEATER LOCATION. RE: GENERAL NOTES AND REQUIREMENTS FOR PHASING OF WORK.
- DISCONNECT POWER TO EXISTING CIRCULATION PUMP AND REMOVE DISCONNECT SWITCH. EXTEND CIRCUIT TO NEW CIRCULATION PUMP LOCATION. RE: GENERAL NOTES AND REQUIREMENTS FOR PHASING OF WORK.
- PROVIDE 250V/1P/30A LOCKABLE DISCONNECT AND MAKE POWER CONNECTION TO WATER HEATER. EXTEND CIRCUIT TO NEW LOCATION FROM PREVIOUS LOCATION. ROUTE CIRCUIT THROUGH CONTRACTOR FOR WATER HEATER SHUTDOWN UPON ACTIVATION OF 'EPO' SWITCH. RE: DETAIL.
- PROVIDE 120V/1P/20A TOGGLE-TYPE DISCONNECT AND MAKE POWER CONNECTION TO WATER SOFTENER. PROVIDE DUPLEX GFI RECEPTACLE AS REQUIRED, COORDINATE FINAL LOCATION WITH PLUMBING CONTRACTOR.
- PROVIDE 120V/1P/20A TOGGLE-TYPE DISCONNECT AND MAKE POWER CONNECTION TO MIXING VALVE WITH RECIRCULATION PUMP. EXTEND CIRCUIT TO NEW LOCATION FROM PREVIOUS CIRCULATION PUMP.
- PROVIDE 120V/1P/20A TOGGLE-TYPE DISCONNECT AND MAKE POWER CONNECTION TO CIRCULATION PUMP ASSOCIATED WITH WATER HEATER. ROUTE CIRCUIT THROUGH TERMINAL STRIP ON WATER HEATER AS REQUIRED BY MANUFACTURER. FIELD VERIFY DISCONNECT LOCATION.
- EXISTING ELECTRICAL EQUIPMENT TO REMAIN.
- EXISTING 200A 120/208V PANEL TO REMAIN.
- PROVIDE NEW CIRCUIT FROM EXISTING 1P/20A SPARE BREAKER IN EXISTING 200A 120/208V PANEL.
- PROVIDE NEW 'EPO' SWITCH. RE: DETAIL.
- PROVIDE NEW 2P CONTACTOR. RE: DETAIL.

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FLOOR PLANS -
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SHEET 4 OF 4
10.22.2019